Appendix 1: Supplemental Analyses

The latent class analysis conducted in this study was exploratory in nature and did not conform to all of the strict requirements usually necessary for a latent class model. For this reason, we conducted a supplemental analysis to understand how our assumptions about the latent classes could potentially change the results.

Three classes of cannabis use patterns (low, medium, high) were derived from the unconstrained LCA model presented in the primary analyses. In our supplemental analysis, we constrained several rho parameters to change the item responses probabilities in a manner consistent with these three classes. For example, in the primary analysis, the item response probabilities associated with using only 1-9 days in the past month and using one time per day for someone in the low-frequency class were 46% and 56% respectively. However, in our supplemental analyses, we increased these probabilities to 80% and 65% respectively (supplemental table 1). By "amplifying" the most important item response probabilities associated with each of the three classes that were derived in the primary exploratory analyses, we could test the robustness of the results by analyzing the primary independent variables (e.g., delay discounting) in relation to a more "extreme" version of the hypothesized classes.

Supplemental Table 1. Item Response Probabilities of Constrained LCA model

	Class1	Class2	Class3
Used 1-9 days	**0.80**	0.10	0.10
1 time per day	**0.65**	0.00	0.10
Used 10-29 days	0.10	0.10	0.20
2-3 times per day	0.35	0.13	**0.90**
Used 30 days	0.10	**0.80**	**0.70**
4+ times per day	0.00	**0.87**	0.00

After creating the classes, individual observations were then assigned to a latent class based on the highest posterior probability of membership. These classes were then used as the outcome in a multinomial logistic regression model with the same independent variables that were used in the primary analyses (supplemental table 2). Results from this model were highly consistent with the results from the primary analyses with regard to both the direction, magnitude, and statistical significance of effects. One exception was employment/work in which the direction of the effect switched. The relationship between employment and these cannabis use patterns may be an important next step in this line of research.

Supplemental Table 2. Overall Model Criteria and Fit Statistics.

	Model Fitting Criteria	Likelihood Ratio Tests		
Effect	**-2 Log Likelihood of Reduced Model**	**Chi-Square**	**df**	**Sig.**
Intercept	5031.005[a]	.000	0	.
DD	5037.894	6.889	2	.032
CCMs	5114.112	83.107	2	.000
NU	5037.042	6.037	2	.049
Age	5033.318	2.313	2	.315
AS Physical	5031.179	.174	2	.917
AS Cognitive	5042.484	11.479	2	.003
AS Social	5032.317	1.311	2	.519
Gender	5033.436	2.431	2	.297
Employment	5044.152	13.147	2	.001
Tobacco Use	5037.898	6.893	2	.032
Total Cannabis Methods	5126.441	95.436	6	.000

Table 3. Parameter Estimates

								CI - RR	
		B	SE	Wald	df	Sig.	RR	LB	UB
Low Use Vs. High Use	**Intercept**	-.303	.551	.302	1	.583			
	DD	-.046	.032	2.09	1	.149	.955	.897	1.017
	CCM	-.513	.080	41.25	1	.000	.599	.512	.700
	NU	-.244	.101	5.85	1	.016	.784	.643	.955
	Age	.000	.005	.005	1	.946	1.000	.989	1.010
	AS_physical	.006	.024	.067	1	.796	1.006	.959	1.056
	AS_cognitive	.032	.026	1.55	1	.214	1.033	.982	1.086
	AS_social	.021	.033	.416	1	.519	1.021	.958	1.089
	Female	-.165	.119	1.92	1	.166	.848	.671	1.071
	Work	-.086	.126	.47	1	.495	.918	.717	1.175
	No Tobacco Use	.266	.117	5.17	1	.023	1.305	1.037	1.642
	One Method	1.047	.195	28.76	1	.000	2.850	1.944	4.179
	Two Methods	.644	.216	8.87	1	.003	1.904	1.246	2.908
	Three Methods	.820	.228	12.92	1	.000	2.271	1.452	3.551
Medium Use Vs. High Use	**Intercept**	.673	.413	2.66	1	.103			
	DD	.038	.024	2.51	1	.113	1.039	.991	1.090
	CCM	.190	.053	12.97	1	.000	1.210	1.091	1.342
	NU	-.030	.080	.137	1	.712	.971	.829	1.136
	Age	-.006	.004	2.12	1	.145	.994	.986	1.002
	AS_physical	-.004	.019	.049	1	.824	.996	.959	1.034
	AS_cognitive	-.053	.021	6.55	1	.011	.948	.910	.988
	AS_social	.029	.026	1.23	1	.268	1.029	.978	1.083
	Female	-.105	.094	1.260	1	.262	.900	.749	1.082
	Work	-.359	.100	12.78	1	.000	.698	.574	.850
	No Tobacco Use	.185	.093	3.97	1	.046	1.204	1.003	1.445
	One Method	-.605	.119	25.67	1	.000	.546	.432	.690
	Two Methods	-.634	.138	21.25	1	.000	.530	.405	.694
	Three Methods	-.257	.146	3.08	1	.079	.774	.581	1.030

Note: Reference category is High Use Class. P values of variables in overall model and specific comparisons were bolded and italicized. Four methods is the referent category for methods of use.